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Earthquake Town Meeting

Stephen Horton
Center for Earthquake Research and Information, University of Memphis
3890 Central Avenue
Memphis, TN 38152
Telephone: (901) 678-4896
FAX: (901) 678-4734
Email: shorton@memphis.edu

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ABSTRACT

Earthquake Town Meetings involve holding public forums in at risk cities in the New Madrid Seismic Zone to share information about earthquake hazard and planned emergency response. Typically, a 30 minutes PPT presentation is followed by a 45 minute question and answer period with a panel of experts. A seismologist normally gives the presentation. Panel members have included representatives from the state department of geology, state, regional and local EMA, FEMA, USGS, and CUSEC. Local civic leaders are often in attendance.

The earthquake town meetings are generally well attended, and they seem to respond to genuine public concerns. Following Hurricane Katrina many local mayors and emergency managers requested holding these meetings in their towns. The Center for Earthquake Research and Information at the University of Memphis coordinate these requests with the Central US Earthquake Consortium and the state earthquake program manager. The state Public Information Officer and local EMA often advertise the meeting. Earthquake town meetings have been held in Arkansas, Missouri, Illinois, Kentucky, and Tennessee.

A presentation, *The Mw=4.2 Northern Illinois Earthquake of 28 June 2004 and the Value of Earthquake Town Meetings*, was given at the 2004 eastern SSA meeting. A presentation at the 2005 eastern SSA meeting in Memphis, *Earthquake Town Meetings Held in the New Madrid Seismic Zone*, discussed the Town Meeting protocol and format. A handout was developed providing web addresses that contain important information about earthquakes; what an earthquake is, what to do to prepare, what to do during, and what to do after.

Project Results

Introduction

The original intent of *Earthquake Town Meeting* had been to develop a protocol for organizing and conducting a town meeting within days of a significant earthquake in the affected area. The Center for Earthquake Research and Information (CERI) at the University of Memphis regularly responds to moderate-sized earthquakes in the Eastern US by deploying seismic instruments to record aftershocks. The intent was to coordinate both activities.

However, the protocol was actually developed in planning the first two earthquake town meetings held during 2005 in Blytheville, AR and Dyersburg, TN to address public concerns that the “big one” was imminent following three widely felt (approximately magnitude 4) earthquakes in the New Madrid Seismic Zone (NMSZ). The town meeting protocol requires coordination with federal, state and local officials, as well as area academics. The state earthquake program manager and the Central US Earthquake Consortium (CUSEC) were found to be valuable points of first contact to help establish this coordination. The town meetings provide a forum to share information about the NMSZ, emergency management, recent earthquakes, and general earthquake

preparedness with the public. An opportunity is also available for the public to express their concerns to a panel of earthquake experts. The town meetings are well attended and received.

Since hurricane Katrina, the earthquake town meetings have been adapted for presentation about disaster preparedness to local at risk communities in the NMSZ. At this time local emergency management can request from the state earthquake program manager an earthquake town meeting in their community. Town meetings are then organized that generally include a FEMA and USGS representative; state earthquake program manager or PIO; state, regional and local EMA; as well as CUSEC and me (CERI). In 2005, town meetings were held in Caruthersville, MO and Piggot, AR with this change in focus. In 2006, town meetings were held in Sikeston, MO; Princeton, KY and Jonesboro, AR. State earthquake program managers in Arkansas, Kentucky and Missouri have stated the desire to hold earthquake town meetings in all at risk communities in their states.

Earthquakes present an opportunity to outreach to a community with a piqued interest. These people may have literally been shaken! They want information and an opportunity to express their concerns to an earthquake expert. Organizing and conducting an earthquake town meeting within days of the event in the affected area provides a genuine public service. This is a teachable moment during which people are receptive to learning about the Earthquake Hazards Program (EHP), and what the EHP is doing for communities like theirs.

We developed a protocol for organizing and conducting an earthquake town meeting. This includes structuring the meeting and preparing materials. The earthquake town meeting is a potentially high-profile media event (the profile scales with earthquake significance). It offers an opportunity to establish a positive link between community concerns and the EHP. The earthquake town meeting protocol can be implemented within the NEHRP post-earthquake coordination plan (Holzer et al., 2002). The earthquake town meeting efforts can be coordinated through the Technical Clearinghouse and approved by the NEHRP Investigations Coordinator when a “significant” earthquake is declared. The earthquake town meeting is an opportunity to directly transfer results of the CEUS EHP research to a highly motivated user group.

The structure for the earthquake town meeting includes a 30-minute PowerPoint presentation, a 30-45 minute panel discussion, and a 30-minute media/panel breakout. The presentation uses EHP products such as the community intensity maps and USGS hazard maps. Maps and a science plan for the aftershock deployment can be presented, and questions such as those listed above can be addressed. The panel can include leaders from the local community, as well as a body of earthquake experts. Representatives from the USGS, CUSEC, the state PIO and the academic community can be invited to sit on the panel and to participate in the media breakout.

Protocol

We developed a protocol for organizing and conducting an earthquake town meeting, especially in the CEUS. This transportable earthquake town meeting protocol benefits NEHRP by integrating and promoting their existing products. The earthquake town meeting is a potentially high profile media event (the profile scales with earthquake significance) that directly conveys a positive link between community concerns and the NEHRP. The idea capitalizes on a "teachable moment" that could be used anywhere and would rely on state PIO's as primary contacts for the process. At all levels the earthquake town meeting protocol requires coordination with state and local officials, as well as area academics. State PIO's and CUSEC are valuable points of first contact to help establish this coordination.

The major elements (MEETING AGENDA) of the earthquake town meeting are outlined below. This is followed by sections on MEETING SET-UP and MEETING PRODUCTS.

MEETING AGENDA (1-2HR)

- 1) A 30-minute PowerPoint presentation –
 - a) The presentation should integrate NEHRP products such as the community internet intensity maps and USGS hazard maps.
 - b) Maps and a science plan for the aftershock deployment should be presented.
 - c) The presentation should specifically address questions such as:
 - i) *Does this mean there is going to be an even larger earthquake?*
 - ii) *Are there going to be large aftershocks?*
 - iii) *How long will the aftershocks continue?*
 - iv) *Why did it happen here?*
- 2) A 30-minute panel discussion-- general public questions panel or simply expresses their concern. A panel can include:
 - a) Local Community Representatives
 - i) Fire or Police Chief
 - ii) Mayor or town administrator
 - b) External Experts
 - i) USGS regional coordinator
 - ii) Federal or state EMA
 - iii) State Public Information Office
 - iv) CUSEC
 - v) Academic community
- 3) Media Breakout (30 minutes) – Although we would encourage media to tape the entire meeting, we see an advantage to offering a media breakout to allow one-on-one interaction between panel and media.

This basic town meeting agenda can be suitably scaled to the significance of the event. For a moderate event, the PI's may give the presentation and embody the entire external panel. While for a "significant" event, the NEHRP "Investigations Coordinator" might give the presentation, and the panel might consist of many nationally recognized experts. The basic format is amenable to both extremes. The difficulty is in setting up the meeting in a timely fashion.

MEETING SET-UP

Although “significant” and less “significant” earthquakes are quite different in scale, one essential similarity with regard to an ETM is that the point of contact with the news media and general public should be close to the earthquake. The remote aspect introduces similar travel, communication, contact, and coordination issues. Preparing for and conducting the earthquake town meetings for moderate size events, will help us get it right for the “significant” event.

Set-UP is mostly about contacting and coordinating with the right people. State earthquake program managers, PIO’s, and CUSEC are productive points of first contact. Through them, we can establish local contacts to help arrange the items listed below. In addition state PIO’s and CUSEC would make excellent hosts and panel members.

CERI generally coordinates aftershock deployments with interested academics. For instance, Martin Chapman of VPI was invited to participate in both the Central Virginia and Fort Payne earthquake deployments in 2003. However, we have not previously taken advantage of the opportunity to coordinate the deployment with state PIO’s and CUSEC.

- 1) Determine need and scale for ETM
 - a) The event warrants an aftershock survey. At CERI, there is no clear minimum magnitude or distance requirement. In 2003 we traveled 100 miles for an Mw=4.0 event; 500 miles for an Mw=4.6 event; and 900 miles for an Mw=4.2 event. An Mw=6.0 anywhere in the EUS would be definite. Otherwise a committee decision is usually made. In general, the event would have to be widely felt.
 - b) Local interest in the event should be keen. This requires evaluation in the field. However, the decision to pursue an EMT would occur in coordination with all the PI’s and the USGS regional coordinator.
 - c) After a decision that an EMT would be worthwhile, contact and coordination with as many people is necessary. Points of first contact would be the state PIO and CUSEC. Through these contacts, the remaining setup tasks could be coordinated.
- 2) Determine place and time - A meeting of about 100 people in a community center, church, school, etc. (free). The meeting would take a couple of hours and occur two or three days following the earthquake. This may be easier to set up in the field do to personal contact depending on the size and location of the earthquake in question.
- 3) Designate host – The person giving the presentation. For a moderate-sized event, the host may be one of the PI’s, depending on interest level. For larger events, the host may come from the panel.
- 4) Invite panel members – They should represent both the local community and the external (expert) community. The panel makeup depends on the size and locality of event. Local community panel members could include a community leader (e.g. mayor), local emergency management (e.g. fire chief), city, county, state engineer. External (expert) community panel members could include USGS (e.g. Regional

Coordinator), a CUSEC representative, and the state PIO. It is also important to include members of the academic community.

- 5) Notify media and public – We anticipate media coverage of the ETM. We would promote this as it is an opportunity to provide information to the media in a controlled environment with props in hand. Typically, field interviews with media representatives are conducted while the field crew is trying to install seismometers with no prepared figures. The interviewer sets the agenda and the response is passive. It would be more productive to let them film the presentation, then give them time for questions during a media breakout. For the Fort Payne, AL earthquake, I was interviewed in the field by a TV station out of Chattanooga, TN nearly 100 miles from Fort Payne.

MEETING PRODUCTS

- 1) ETM PowerPoint presentation including
 - a) The community internet intensity map for the event
 - b) Shake map (when available)
 - c) A USGS Seismic Hazard map tailored to the affected community
 - d) Local historic seismicity map
 - e) Information slides on aftershock/foreshock statistics in ENA
 - f) Epicenter and station map for this event including portable stations and aftershocks
 - g) Movie clip illustrating typical installation of aftershock instruments
 - h) Results of previous aftershock studies
- 2) ETM Web Site - We plan an ETM web site that will contain useful links for communities that have been affected by an earthquake. Examples include:
 - a) CUREE - The Earthquake Damage Assessment and Repair Project (<http://www.curee.org/projects/EDA/>)
 - b) Questions and Answers on Earthquake Insurance. - The Nevada Seismological Laboratory (<http://www.seismo.unr.edu/Perminfo/insurance.html>)
 - c) Earthquake Summary Poster series (<http://neic.usgs.gov/neis/poster/>)
- 3) ETM Handouts
 - a) A short paper version of the WEB Site. (appendix)
 - b) Earthquake manual for Teachers

REFERENCES

- Bodin, P. and S. Horton (2004, accepted). Source Parameters and Tectonic Implications of Aftershocks of the Mw 7.6 Bhuj Earthquake of January 26, 2001, BSSA.
- Holzer, T., R. Borchardt, C. Comartin, R. Hanson, C. Scawthorn, K. Tierney, and L. Youd (2002). A plan to coordinate NEHRP post-earthquake investigations, *Applied Technology Council*.
- Horton, S.P., The Mw=4.2 Northern Illinois Earthquake of 28 June 2004 and the Value of Earthquake Town Meetings, *eastern section of the Seis. Soc. Am.*, (2004).
- Horton S. P., W.Y. Kim, and M. Withers, The 6 June 2003 Bardwell, Kentucky, Earthquake sequence: Evidence for a Locally Perturbed Stress Field in the Mississippi Embayment, *Bull. Seism. Soc. Am.* 95, 431-445.
- Horton, S.P., Patterson, G., Wilkinson, J., And Johnston, J. S. Earthquake Town Meetings Held in the New Madrid Seismic Zone, eastern section of the Seis. Soc. Am., (2005).
- Wang, Z., E. W. Woolery, and B. Shi (2003). Observed seismicity (earthquake activity) in the Jackson Purchase region of western Kentucky: January through June 2003, Special Publication 6, Kentucky Geological Survey, Series XII.

Appendix



The following are web addresses that contain important information about earthquakes; what an earthquake is, what to do to prepare, what to do during, and what to do after. The writing underneath are only suggested places to start. Please share this helpful information with others.

- <http://www.ceri.memphis.edu>

Select public awareness to view recent earthquake information, earthquake facts and fiction, how to survive an earthquake, the New Madrid Seismic Zone, & much more.

- <http://www.cusec.org>

For information about Seismic Zones in the Central US, earthquake safety, and related information.

- <http://pubs.usgs.gov/fs/fs-131-02/>

For information about Earthquake Hazards in the Central U.S.

How to prepare for an earthquake.

- <http://www.redcross.org>

Select "Get Prepared" which is in a blue box on the left. From there select "Prepare for all Disaster Types," next select "Earthquakes". It is also a good idea to look at how to prepare for the other disasters.

- <http://www.fema.gov>

Under library select "Preparation & Prevention". Scroll down to the section on Earthquakes. The section is divided up into three parts General Information, Homeowners and schools, and Building Professionals and Engineers.

- <http://www.oes.ca.gov/Operational/OESHome.nsf/1?OpenForm>

Select earthquake program. This is a California emergency website, but the information under earthquake planners and earthquake preparedness is good for anyone.

What is an earthquake?

- <http://neic.usgs.gov/neis/states/>

Click on different states to get the earthquake information related to that state.

- <http://pubs.usgs.gov/publications/text/dynamic.html>

This Dynamic Earth: The Story of Plate Tectonics

Frequently Asked Questions

- <http://earthquake.usgs.gov/faq/>